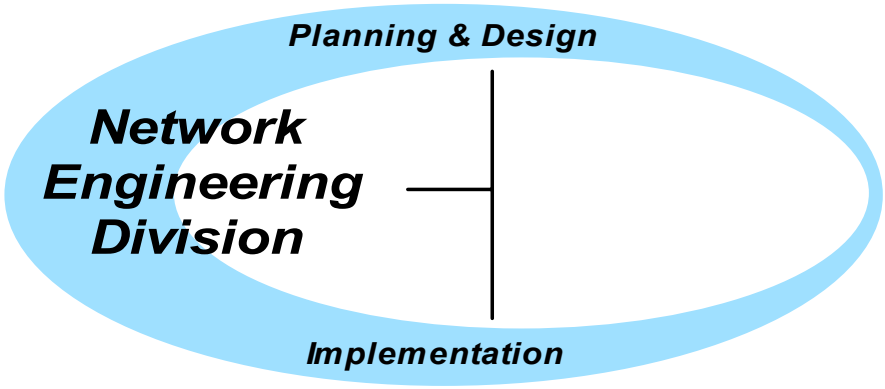
PROJECT PLAN

Network Assessment and Resource Planning For The Procurement Desktop (IDEAS-PD) Project



Office of the Chief Information Officer
Network Engineering Division

February 14, 2000

Version 2.0

United States Department of Agriculture

INTRODUCTION

The mission critical programs of USDA Agencies and Offices are aimed to meet the diverse, complex set of services required by private, business, educational, and government communities, both American and international. To satisfy increasing demands, USDA relies heavily on the latest information technologies. Critical to the successful implementation and management of this technology is the development of a structured methodology for measuring, analyzing, and optimizing information transfer. The Network Engineering Division, part of Telecommunications Services and Operations/Office of the Chief Information Officer, has developed and documented such a process, called Resource Planning Methodology.

Resource Planning Methodology is a structured approach to manage a dynamic network technology infrastructure objectively and reliably. It requires understanding the existing network performance and survivability and new business application features in addition to being able to predict the effects of the implementation of the new business application on the existing network infrastructure. This project plan addresses the use of the Resource Planning Methodology in determining the network resource characteristics and requirements of the Procurement Desktop application.

BACKGROUND

The Office of Procurement, Property, & Emergency Preparedness, Procurement Policy Division, Procurement Modernization Team (OPPEP/PPD/PMT) is starting the assessment of IDEAS-PD, which is a COTS integrated procurement software package, at the Acquisition Modernization Laboratory (AML) in Fort Collins, Colo. The assessment will do the following: (1) determine if an acceptable level of defined USDA procurement functionality is met; (2) support a decision whether or not to recommend purchase of the software to proceed to a pilot installation and, eventually, a USDA-wide implementation; and (3) identify potential software, hardware, or network problems that need to be addressed.

The objectives of the procurement modernization effort are the following: (1) to provide modern, integrated automation tools and a streamlined process to the USDA acquisition community; (2) to reduce the costs of processing procurement actions; (3) to reduce procurement lead time; (4) to provide accurate, real-time management information on USDA's procurement activity; (5) to integrate/interface with the Departmental Financial System of Record (FFIS), (6) to support one-time data entry; and (7) to complement the efforts of the Purchase Card program. IDEAS-PD appears to be able to satisfy the above stated objectives, and the planned assessment will help USDA decide if IDEAS-PD is the best option to satisfy the needs of USDA's procurement community. Another critical aspect of the assessment process is the ability to determine how well the software functions within the USDA computer network.

PMT purchased IDEAS-PD software licenses through the Department of Interior's franchise option. The software was installed in the AML the week of September 20-23, 1999, and will be configured by mid November to function within USDA procurement

business practices. The software will also be installed at the National Finance Center during the second quarter of FY-2000.

An extensive installation of the software in locations outside the AML is not planned during the assessment. Outside installation of the software will most likely be limited to several computers at the OPPM office in Washington, DC. While there is a DOI/AMS interface developed between the software and AMS' Foundation Financial System (FFS), the software will need to be customized to interface with the USDA version of FFS. The FFS interface will be reviewed during the assessment process, particularly the telecommunications aspect of the developed interface.

CUSTOMER REQUIREMENTS

The USDA network will link users (i.e. procurement personnel, reviewing and approving officials, and management officials). PMT needs the Network Engineering Division (NED) to submit a proposal for evaluating the impact of implementing IDEAS-PD on the USDA network. Based on previous discussions with NED, PMT would like the proposal to address the following areas:

1. Measurement of IDEAS-PD demands on the network
2. Measurement of the application's profile prediction of network performance
3. Identification of network problem areas with pilot test locations and associated network infrastructure
4. Development of LAN/WAN diagrams to help develop the finalized PMT requirements document
5. Research and diagrams of Agency and Department level network infrastructure needed to support application operation
6. Proposal of schedule for assessment completion and development of a draft report

PURPOSE/SCOPE

This project plan describes the use of the Network Engineering Division (NED) staff and resources to perform a network assessment for the Procurement Desktop application. The specific tasks, milestones, and deliverables are described below. The plan will be subject to approval by the Procurement Modernization Team (PMT) project office. Responsibility for obtaining any necessary Information Technology Waivers and/or approvals rests with the PMT project office. The approval of this project plan will grant NED full authority and funding to execute the plan within the scope of existing approvals and/or waivers.

ASSUMPTIONS AND CONSTRAINTS

The following assumptions and constraints have been identified based on past experience with these activities. Specification of timeframes, resource requirements, and associated deliverables are based on these items. Changes in assumptions and/or failure to adhere to these items constitute a changed condition/requirement and require reassessment of the

project plan. All "changed conditions/requirements" will be documented, and the resulting modifications to this project plan will initiate a new project plan version.

- The analysis requires access to the network infrastructure and test labs. All parties must provide timely cooperation to meet the project objectives and schedule. PMT project team is responsible for ensuring that NED has timely access to network infrastructure to install network probes (sniffers) and to sample SNMP data from routers.
- The PMT project team will be responsible for providing access to the application clients and servers and assisting with scheduling and performing of all application testing. NED will capture data during the testing. Close coordination of the testing will be required.
- Application test script and demographic information are prerequisites for the timely simulation completion and analysis portions of this project. The PMT project team will be responsible for providing this information.
- This analysis will be made based on a "snapshot" of the existing network. No attempt will be made to account for growth projections of the network baseline.
- Network design recommendations will not be made based on this analysis. A comprehensive analysis of all major USDA network applications is required to produce design recommendations and is beyond the scope of this project plan.

In addition, the customer (PMT) has identified the following conditions and assumptions:

- PMT office in Washington, DC, will serve as monitor for the total project effort as well as be the contact point for NED.
- The National Finance Center will be the central point for the IDEAS-PD program database(s).
- IDEAS-PD will use Oracle 8 as the database.
- IDEAS-PD must be installed on the desktop for each of the reviewing, approving procurement officials and for management officials. For USDA, the total could be between 1500 to 3500 end users across the United States.
- Attachments to solicitations are handled as BLOBS (letters, drawings, etc.).
- Solicitations and vendor responses are posted to the Internet using the Department of Interior's Electronic Commerce system.

ROLES AND RESPONSIBILITIES

This document describes the project plan for the NED support responsibilities. The document identifies PMT responsibilities but does not include project planning for the execution of these responsibilities. The following section includes a brief description of the specific PMT responsibilities. The "CONTACTS" section identifies points of contact and team membership.

STATEMENT OF WORK – NETWORK ENGINEERING DIVISION

The following table outlines the tasks necessary to complete this project. The completion of these tasks will lead to the development of a report quantifying the network

characteristics and application performance metrics, as well as identification of any potential problem areas in the networks as represented by the pilot test locations.

Table 1 Statement of Work

Task	Description	Deliverable	Responsibility
WBS 1.2 Initial Planning & Equipment Deployment			
WBS 1.2.1 Receive/Develop Test Scripts from PMT	PMT: Develop a representative test script to use in all application profiling and testing. Describe this test suite to NED.	Informal Documentation	PMT
WBS 1.2.2 Develop Logistics and Test Plan	NED: Coordinate and develop equipment (Sniffers, servers, and clients) placement plan, and application test plan (roles and responsibilities). Obtain appropriate IP addresses, resolve security issues. PMT: Participate in information meetings and/or phone calls. Provide access to servers, clients, and network components. Provide IP addresses and network access for test equipment to NED.	Informal Documentation	NED, PMT
Task	**Description**	**Deliverable**	**Responsibility**
WBS 1.3 Application Baseline Measurement – Lab Testing (Develop database of information needed to model and simulate the application accurately. This task may be scheduled to coincide with IDEAS-PD testing.)			
WBS 1.3.1 Deploy Test Equipment (Location: PMT Test Lab – Fort Collins, Colo.)	NED: Configure and place Sniffers/Test equipment on LAN segments to capture application traffic as described in the logistics plan. PMT: Provide access to LAN segments. If LAN segments are remote, PMT personnel may need to install (plug in) the sniffers.	Sniffers connected to the network and tested.	NED, PMT
WBS 1.3.2 Measure Application Information	NED: Sample application transactions during the test period and transport this data to a database. Information such as total bytes transferred, total packets transferred, maximum packet size, average packet size, etc., is collected. PMT: Run test scripts (Optional – NED may be able to run tests).	Database of sampled information.	NED, PMT
WBS 1.3.3 Analyze Application Information	NED: Process and analyze the data collected in the previous task.	Internal project analysis results and working files.	NED
WBS 1.3.4 Develop Application Performance Characteristics Report	NED: Prepare a report that presents the network performance characteristics and performance metrics of the IDEAS-PD application as measured in the test lab environment.	Formal report document.	NED

WBS 1.4 Application Baseline Measurement – Pilot Testing DC/FC (Develop database of information needed to model and simulate the application accurately. This task may be scheduled to coincide with IDEAS-PD testing.)			
WBS 1.4.1 Update Logistics & Test Plan/Deploy Test Equipment (Location: PMT Office - Washington DC and Test Lab - Fort Collins, Colo.)	NED: Configure and place Sniffers/Test equipment on LAN segments to capture application traffic as described in the logistics plan. PMT: Provide access to LAN segments. If LAN segments are remote, PMT personnel may need to install (plug in) the sniffers.	Sniffers connected to the network and tested.	NED, PMT
WBS 1.4.2 Measure Application Performance over DC/FC Network	NED: Sample application transactions during the test period and transport this data to a database. Information such as total bytes transferred, total packets transferred, maximum packet size, average packet size, etc., is collected. PMT: Run test scripts.	Database of sampled information.	NED, PMT
WBS 1.4.3 Analyze Application Performance over DC/FC Network	NED: Process and analyze the data collected in the previous task.	Internal project analysis results and working files.	NED
WBS 1.4.4 Update Application Performance Characteristics Report	NED: Prepare a report that presents the network performance characteristics and performance metrics of the IDEAS-PD application as measured in the test lab environment.	Formal report document.	NED
WBS 1.5 Application Baseline Measurement – Pilot Testing DC/NFC (Develop database of information needed to model and simulate the application accurately. This task may be scheduled to coincide with IDEAS-PD testing.)			
WBS 1.5.1 Update Logistics & Test Plan/Deploy Test Equipment (Location: PMT Office – Washington, DC, and Applications Server - NFC)	NED: Configure and place Sniffers/Test equipment on LAN segments to capture application traffic as described in the logistics plan. PMT: Provide access to LAN segments. If LAN segments are remote, PMT personnel may need to install (plug in) the sniffers.	Sniffers connected to the network and tested.	NED, PMT
WBS 1.5.2 Measure Application Performance over DC/NFC Network	NED: Sample application transactions during the test period and transport this data to a database. Information such as total bytes transferred, total packets transferred, maximum packet size, average packet size, etc., is collected. PMT: Run test scripts.	Database of sampled information.	NED, PMT
WBS 1.5.3 Analyze Application Performance over DC/NFC Network	NED: Process and analyze the data collected in the previous task.	Internal project analysis results and working files.	NED
WBS 1.5.4 Update Application Performance Characteristics Report	NED: Prepare a report that presents the network performance characteristics and performance metrics of the IDEAS-PD application as measured in the test lab environment.	Formal report document.	NED

Statement of Work, Continued

WBS 1.6 Application Baseline Measurement – Pilot Testing To Be Determined/NFC (Develop database of information needed to model and simulate the application accurately. This task may be scheduled to coincide with IDEAS-PD testing.)			
WBS 1.6.1 Update Logistics & Test Plan/Deploy Test Equipment (Location: PMT Pilot Test Location – To Be Determined and Applications Server - NFC)	NED: Configure and place Sniffers/Test equipment on LAN segments to capture application traffic as described in the logistics plan. PMT: Provide access to LAN segments. If LAN segments are remote, PMT personnel may need to install (plug in) the sniffers.	Sniffers connected to the network and tested.	NED, PMT
WBS 1.6.2 Measure Application Performance over Pilot Network	NED: Sample application transactions during the test period and transport this data to a database. Information such as total bytes transferred, total packets transferred, maximum packet size, average packet size, etc., is collected. PMT: Run test scripts.	Database of sampled information.	NED, PMT
WBS 1.6.3 Analyze Application Performance over Pilot Network	NED: Process and analyze the data collected in the previous task.	Internal project analysis results and working files.	NED
WBS 1.6.4 Update Application Performance Characteristics Report	NED: Prepare a report that presents the network performance characteristics and performance metrics of the IDEAS-PD application as measured in the test lab environment.	Formal report document.	NED
WBS 1.7 Develop Final Report			
Develop Comprehensive Report	NED: Document the overall results of all testing, lessons learned, and recommendations for future network resource planning activities. PMT: Review documentation.	Formal Document.	NED, PMT

Task Order Start and Completion Dates

Task completion efforts are to commence on **February 9, 2000**, and are expected to end no later than **September 7, 2000,** unless extended by the PMT through formal, written notification to the NED. Figure 1 on the following page shows the project Gantt chart.

ID	WBS	Task Name
1	1	**Network Evaluation-NED**
2	1.1	**Project Start**
3	1.1.1	Initiate Project
4	1.1.2	Kickoff Meeting
5	1.1.3	Project Management Support
6	1.2	**Initial Planning & Equipment Deployment**
7	1.2.1	Receive/Develop Test Scripts From PMT
8	1.2.2	Develop Logistics and Test Plan
9	1.2.3	Equipment Deployment Planning Complete
10	1.3	**Application Baseline Measurement - Lab Testing**
11	1.3.1	Deploy Test Equipment
12	1.3.2	Measure Application Information
13	1.3.3	Analyze Application Information
14	1.3.4	Develop Application Performance Characteristics Report
15	1.3.5	Initial Application Analysis Report Complete
16	1.4	**Application Baseline Measurement - Pilot Testing (DC/FC)**
17	1.4.1	Update Logistics & Test Plan/Deploy Test Equipment
18	1.4.2	Measure Application Performance over DC/FC Network
19	1.4.3	Analyze Application Performance over DC/FC Network
20	1.4.4	Update Application Performance Characteristics Report
21	1.4.5	Application Analysis Report Update Complete
22	1.5	**Application Baseline Measurement - Pilot Testing (DC/NFC)**
23	1.5.1	Update Logistics & Test Plan/Deploy Test Equipment
24	1.5.2	Measure Application Performance over DC/NFC Network
25	1.5.3	Analyze Application Performance over DC/NFC Network
26	1.5.4	Update Application Performance Characteristics Report
27	1.5.5	Application Analysis Report Update Complete
28	1.6	**Application Baseline Measurement -Pilot Testing (TBD/NFC)**
29	1.6.1	Update Logistics & Test Plan/Deploy Test Equipment
30	1.6.2	Measure Application Performance over Pilot Network
31	1.6.3	Analyze Application Performance over Pilot Network
32	1.6.4	Update Application Performance Characteristics Report
33	1.6.5	Application Analysis Report Update Complete
34	1.7	**Develop Final Report**
35	1.7.1	Develop Comprehensive Report
36	1.7.2	Comprehensive Report Finished
37	1.8	**Project End**
38	1.8.1	Project Closure
39	1.8.2	Project Complete

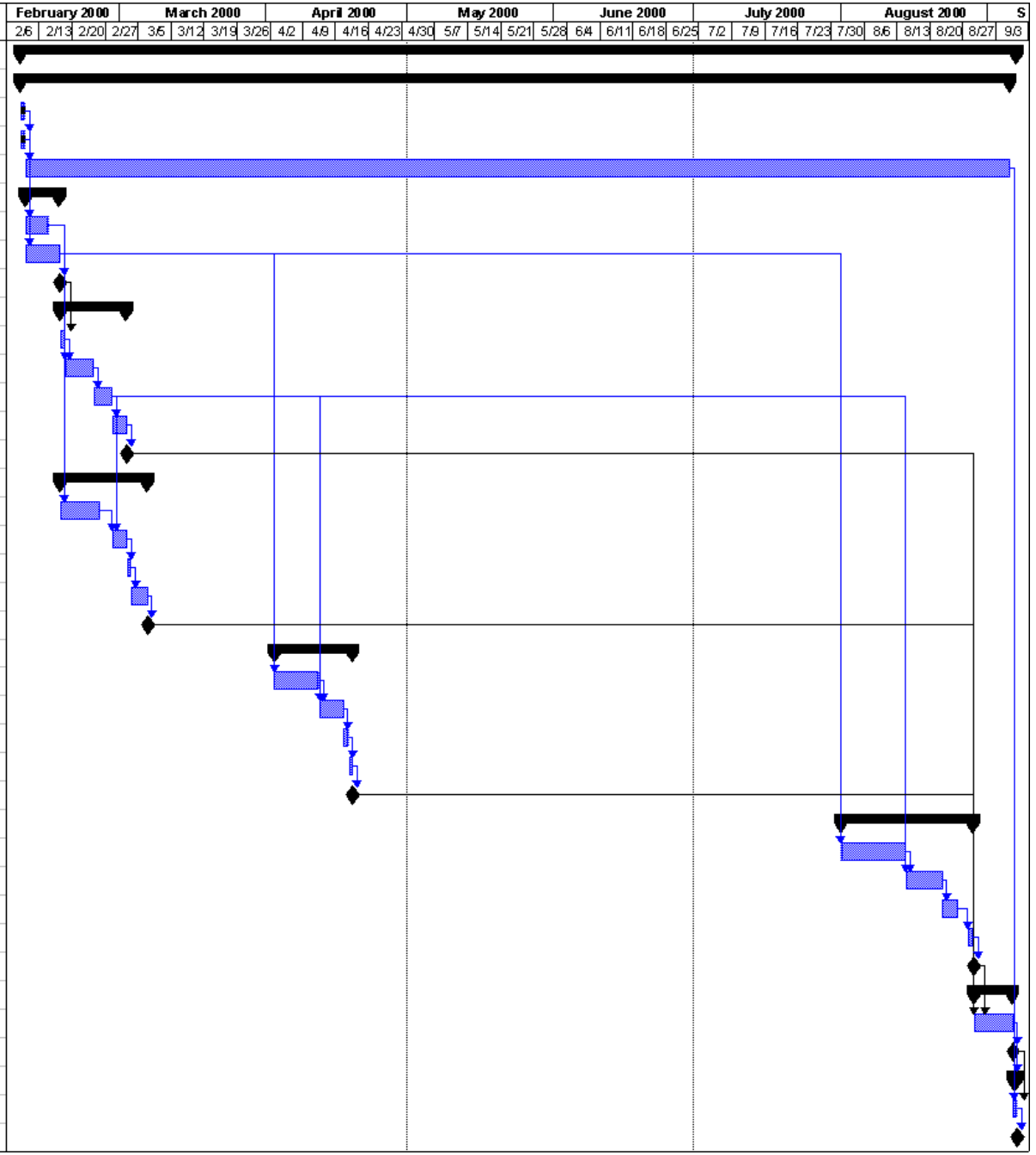


Figure 1 Project Gantt Chart

DELIVERABLES AND DUE DATES

Specific deliverable due dates for each task are subject to change. Dates are dependent on the progress of the project and on the extent and impact of PMT cooperation in providing NED with network information and access. The original schedule will serve as a baseline. Conditions resulting in a request for schedule change by either party (NED or PMT) must be agreed to by both parties.

The only formal deliverable for the project is the final report. Informal project status information will be provided to the PMT Point of Contact (POC) on a bi-weekly basis, identifying current project status, issues needing attention, and impacts to the project schedule, resources, or deliverables. Draft copies of the Application Performance Characteristics Report will be provided as each testing phase is completed.

PERFORMANCE STANDARD

All deliverables shall be due as specified. The PMT POC will review each deliverable within **10 workdays** of receipt. The PMT POC will comment and may require modification, clarifications, and/or additions. The revised document(s) will be due within **10 workdays** of notification of the required changes. In addition, the Network Engineering Division will provide an oral report to PMT with the final report if requested.

All drafts, status reports, and final documentation shall be prepared using Adobe Acrobat 3.0, Microsoft Word 97, Microsoft PowerPoint 97, and Microsoft Project 98. One hard copy original, two copies, and one electronic version of each deliverable document shall be submitted to the PMT POC as delineated below.

FURNISHED RESOURCES

PMT is to provide Wide Area Network access sufficient to support the auto-discovery and traffic analysis requirements at network facilities and pertinent information/documentation sources as required to perform this task.

The NED will provide the personnel and contract resources, Make Systems' modeling software, NetMaker XA, and support equipment necessary to perform the analysis of the IDEAS-PD application within the timeframe of the action plan at USDA facilities.

Project Resources

Table 2 depicts a resource matrix. It identifies the personnel resource requirements and associated skills needed to support this project for the full duration.

Table 2 Project Resource Matrix

Resource Name	Organization (See Note 1)	Planned Work in Hours	NED Staff per Hour Labor Rates	NED Contract per Hour Labor Rates
Program Manager	NED	90	$95.75	
Technical Task Leader	NED	126	$93.62	
Senior Ntwrk Planner/Engr	NED/Contract	192	$85.98	$117.43
Network Engineer	NED/Contract	281	$74.08	$94.03
Systems Analyst	Contract	215		$60.00
Technical Writer	Contract	60		$74.70
Project Manager	Contract	30		$82.27
Total Required		**994**		

Note 1: Assignment of actual personnel resources will vary depending upon availability at time of project plan approval/funding and actual project schedule.

Project Costs

Table 2 shows the monthly labor cost for completing project tasks. Figures include costs for personnel and associated overhead. Although travel is not anticipated, one trip for one person is included in the budgeted costs.

Table 3 Project Labor Cost - Monthly and Cumulative

Month	Planned Monthly Cost	Planned Cumulative Cost
Feb-2000	$ 43,997	$ 43,997
Mar-2000	$40,866	$ 84,863
Total: $ 84,863		

It is estimated that this project will require the acquisition and installation of up to eight (8) Visual Uptime Analysis Service Elements (ASE's) on the pilot test network infrastructure. The ASE unit is an integral part of Visual Network's Visual Uptime System, a real time service level management system that monitors the network performance metrics associated with an application. The ASE unit cost is $3,500/each, which yields an estimated equipment cost of $28,000. Therefore, the total cost estimate for this project plan is $112,863.

The NED is a working capital fund activity. Beginning in Fiscal Year 2000, NED services are a reimbursable activity. The PMT will be billed actual costs associated with the project through appropriate administrative procedure on a monthly basis, not to exceed the project plan total cost estimate shown above. The PMT will provide funding for any additional travel. The PMT will be responsible for replacing any equipment (e.g. Sniffers) lost or damaged as a result of any activity (including shipping) supporting this effort.

The NED shall perform the tasks described in this work statement at the USDA facilities in Fort Collins, Colo. (addresses below), to the maximum extent possible. Travel to other USDA locations is not expected.

USDA Facility Locations:

USDA/OCIO/TSO/NED
Suite 210
2150 Centre Avenue, Bldg. A
Fort Collins, CO 80526-1891
Telephone – (970) 295-5310
Fax – (970) 295-5330

Acquisition Modernization Laboratory
1201 Oakridge Dr., Suite 100
Fort Collins, CO

ACCEPTANCE CRITERIA

Project deliverables shall be considered satisfactorily completed upon written acceptance by the PMT POC of the final deliverable. E-mail response constitutes a written acceptance.

CONTACTS

PMT Point of Contact
Carl Momberger
USDA, OPPEP//PPD/PMT
Reporter's Bldg., Suite 300
300 7th St. SW
Washington D.C. 20024
(202) 720-9816

Network Engineering Division Program Manager
Thomas N. Tokos
USDA/OCIO/TSO
Network Engineering Division
Suite 210
2150 Centre Avenue, Bldg. A
Fort Collins, Colorado 80526-1891
(970) 295-5310

REFERENCE DOCUMENTATION

United States Department of Agriculture, *Network Design Process*, *Issue 1.1*, August 1997

United States Department of Agriculture, *Geographic Network Analysis Process, Version 2.0*, May 1999